

B. Claims

The following is a complete listing of the claims, and replaces all earlier versions and listings.

1. (Currently Amended) A membrane electrode assembly for a solid polymer fuel cell proton-exchange membrane fuel cell, comprising a polymer electrolyte membrane and an electrode metal catalyst layer,

wherein at least a part of the polymer electrolyte membrane infiltrates into the electrode metal catalyst layer, and

wherein the polymer electrolyte membrane is formed by polymerizing a composition containing at least a compound having proton conductivity and a compound having activity to an active energy ray, or a composition containing at least a compound having proton conductivity and activity to the active energy ray, after the composition has been applied onto the electrode metal catalyst layer.

2. (Original) A membrane electrode assembly according to claim 1, wherein a reinforcement member composed of an electrical insulator is provided inside the polymer electrolyte membrane.

3. (Currently Amended) A production method for a membrane electrode assembly for a solid polymer fuel cell proton-exchange membrane fuel cell, the assembly comprising a polymer electrolyte membrane and an electrode metal catalyst layer,

at least a part of the polymer electrolyte membrane infiltrating into the electrode metal catalyst layer, the production method comprising the steps of:

coating the electrode metal catalyst layer with a composition containing at least a compound having proton conductivity and a compound having activity to an active energy ray, or a composition containing at least a compound having proton conductivity and activity to the active energy ray, to form a precursor layer of the polymer electrolyte membrane composed of the composition, at least a part of the composition infiltrating into the electrode metal catalyst layer; and

polymerizing the composition by irradiating the precursor layer with the active energy ray, to form a polymer electrolyte membrane at least a part of which infiltrates into the electrode metal catalyst layer.

4. (Currently Amended) A production method for a membrane electrode assembly according to claim 3, wherein the electrode metal catalyst layer has a thickness of 0.01 to 200 μm , and an infiltration amount of the composition into the electrode metal catalyst layer is equal to or smaller than the thickness of the electrode metal catalyst layer.

5. (Currently Amended) A production method for a membrane electrode assembly according to claim 3, wherein the composition is coated after a reinforcement member composed of an electrical insulator is provided on the electrode metal catalyst layer.

6. (Currently Amended) A solid polymer fuel cell proton-exchange membrane fuel cell comprising a membrane electrode assembly for a solid polymer fuel cell proton-exchange membrane fuel cell, the membrane electrode assembly comprising a polymer electrolyte membrane and an electrode metal catalyst layer,

wherein at least a part of the polymer electrolyte membrane infiltrates into the electrode metal catalyst layer, and

wherein the polymer electrolyte membrane is formed by polymerizing a composition containing at least a compound having proton conductivity and a compound having activity to an active energy, or a composition containing at least a compound having proton conductivity and activity to the active energy ray, after the composition has been applied onto the electrode metal catalyst layer.

7. (Previously Presented) A production method for a membrane electrode assembly according to claim 3, wherein a thickness of the precursor layer is from 5 to 500 μm .